MECHATRONICS BOOK SERIES

CONTROL AND INTELLIGENT SYSTEMS

Momoh Jimoh E. Salami
Abiodun Musa Aibinu
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Chapter 44
Model Structure and Random Input for System Identification Technique for Flexible Manipulating System

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44.1 Parametric Modeling

Parametric models are described by using a model structure and a finite number of parameters which relate the relevant system signals (input, output and disturbances) [1]. These models are described in the discrete time domain, since the identification process is based on experimental data obtained through sampling. In case a continuous model is required, it is possible to convert the model from discrete to continuous time domain. The process of system identification technique for model estimation that characterises the behaviour of a dynamic system can be summarised in four steps, as shown in Figure 44.1.

Model structure selection constitutes one of the most important and difficult decisions that have to be made within the system identification procedure, since model complexity can affect the exactitude at which the model describes the real process [1]. Structure selection means to determine appropriate polynomials that will constitute the model framework. To find the best model implies choosing a convenient structure as well as an adequate number of parameters [2].

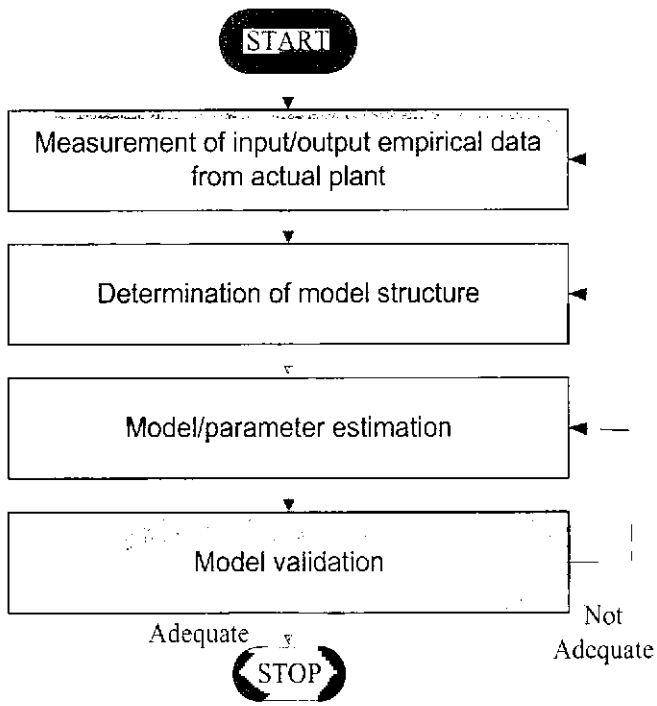

Figure 44.1: System identification procedure